



CURRICULUM VITAE

Dr. Balqis Mohamed Rehan
Department of Civil Engineering
Faculty of Engineering, Universiti Putra Malaysia
43400 Serdang, Selangor, Malaysia

Office: 03-8946 4471

Fax: 03-8658 7129

Education

1. DPhil. Geography and the Environment, 2016, University of Oxford, U.K.
Title: Risk-based flood protection decisions in the context of climatic variability and change.
2. MEng. (Hons) Environmental Engineering, 2009, Universiti Kebangsaan Malaysia (UKM), Malaysia.
3. BEng. (Hons) Civil Engineering, 2007, Universiti Teknologi Malaysia (UTM), Malaysia

Areas of Interest

1. Flood risk assessment and management
2. Statistical hydrology
3. Water Resources Modelling
4. Spatial analysis

Professional Qualification/Membership/Affiliation

1. Member, International Association for Hydro-Environment Engineering and Research (IAHR)
2. Member, International Association of Hydrological Sciences (IAHS)
3. Member, Board of Engineers Malaysia (BEM)
4. Member, Malaysian Society of Engineering and Technology (MSET)

Teaching experiences

| Position | Duration |
|---|---------------------------|
| 1. Senior lecturer, Department of Civil Engineering, Faculty of Engineering, UPM | 11 August 2016 – on going |
| 2. Tutor, Department of Civil Engineering, Faculty of Engineering, UPM | Nov 2007 - 12 August 2016 |
| 3. Coordinator for Master by research, Water Unit, Department of Civil Engineering, Faculty of Engineering, UPM | 2017 – 2021 |

Teaching subjects

1. Surface hydrology (Master course)
2. Fluvial flood risk assessment (Master course)
3. Surface hydrology (Undergraduate course)
4. Hydraulics I and II (Undergraduate course)

Attended training and organizing committee member

1. Participant, training courses on Introduction to River Hydrology and Hydraulics, and Flood Risk Analysis and Management, HR Wallingford and CIWEM, 25 – 28 Februari 2015, Oxford, UK.
2. Participant, Seminar on Hydrology for Flood Risk Management, Joint National and South East Section Meeting of the British Hydrological Society, 21 November 2013, London, UK
3. Participant, Conference on changing extremes in hydrology, 15 April 2013, Oxford, UK
4. Participant, Flooding Conference, Institution of Civil Engineers, 13 May 2015, London, UK
5. Participant, Asiawater 2018, 10 – 12 April 2018, KLCC, UK

6. Publicity committee, Global Civil Engineering Conference 2017, Seri Pacific Hotel, KL.
7. Scientific committee, Better Air Quality Conference 2018, Sarawak.
8. Project leader, primary school program on engineering and science, Ulul Albab Camp, SRIAAB School, 2019, 2020, 2021
9. Participant, training on 'Python 3: Essentials' on 23 and 24 March 2023, Kuala Lumpur.
10. Committee member, Civil Engineering Department Colloquium 2022
11. Student's affairs coordinator, Civil Engineering Department, Faculty of Civil Engineering, Universiti Putra Malaysia.
12. Coordinator for UPM Civil Engineering undergraduate students' mobility program at King Mongkut's University Technology of Thonburi (KMUTT), Thailand from 14 – 27 July 2023.
13. Head of project for community program at the Safetist Farm, Bang Mot, Thonburi, Thailand on bioretention system, 18 July 2023.
14. Head of project, children's activities and awareness programme, Bangi, Malaysia. Disember 2022 and March 2023.

Academic achievement

1. Supervisor to UPM final year undergraduate students obtained gold and silver medals of Final Year Project Open Day in 2022.
2. Supervisor to UPM final year undergraduate students obtained gold and silver medals of Final Year Project Open Day in 2021.
3. Supervisor to students obtained gold medal for 'The Best Thesis Award' national competition in conjunction with the World Water Day 2023.
4. Excellence in teaching awards (2011, 2016, and 2017)
5. Master and PhD supervisor and co-supervisors. To date supervised 3 Master and 2 PhD students, and co-supervised 8 PhD students. 1 PhD and 1 Master students have graduated.

Research contributions

Journals

6. **Rehan, B.M.**, 2018. An innovative micro-scale approach for vulnerability and flood risk assessment with the application to property-level protection adoptions. *Natural Hazards*, 91 (3), 1039-1057. <https://doi.org/10.1007/s11069-018-3175-5>
7. **Rehan, B.M.**, 2018. Accounting public and individual flood protection measures in damage assessment: A novel approach for quantitative assessment of vulnerability and flood risk associated with local engineering adaptation options. *Journal of Hydrology*, 563, 863–873. <https://doi.org/10.1016/j.jhydrol.2018.06.061>
8. Ali, H. L., Yusuf, B., Mohammed, T.A., Shimizu, Y., Ab Razak, M. S., & **Rehan, B. M.**, 2019. Improving the hydro-morpho dynamics of a river confluence by using vanes. *Resources*, 8(1), 9. <https://doi.org/10.3390/resources8010009>
9. Ali, H.L., Yusuf, B., Mohammed, T.A., Shimizu, Y., Ab Razak, M.S., **Rehan, B.M.**, 2019. Assessment of vanes effectiveness in controlling erosion and deposition zones at a river confluence using a 2D model. *International Journal of Integrated Engineering*, 11(2), 223-235. <https://doi.org/10.30880/ijie.2019.11.02.024>
10. Ali, H. L., Yusuf, B., Mohammed, T.A., Shimizu Y., Ab Razak M. S., & **Rehan, B. M.**, 2019. Enhancing the flow characteristics in a branching channel based on a two-dimensional depth-averaged flow model. *Water (Switzerland)*, 11(9), 1863. <https://doi.org/10.3390/w11091863>
11. **Rehan, B. M.**, Yusuf, A. M., & Idham, I. L., 2020. Flood Risk Estimation of Paddy Production Considering Plants' Age and Flood Durations. In: Mohamed Nazri, F. (eds) *Proceedings of AICCE'19. AICCE 2019. Lecture Notes in Civil Engineering*, 53, 1163-1174. https://doi.org/10.1007/978-3-030-32816-0_88
12. **Rehan, B. M.**, Zakaria, F., 2021. Micro-scale flood damage and risk assessments: A case study in Kelantan, Malaysia. *Community, Environment and Disaster Risk Management*, 23, 13-23. <https://doi.org/10.1108/S2040-726220210000023008>
13. Zulkafli, Z., Muharam, F. M., Raffar, N., Jajarmizadeh, A., Abdi, M. J., **Rehan, B. M.**, & Nurulhuda, K., 2021. Contrasting influences of seasonal and intra-seasonal hydroclimatic variabilities on the irrigated

rice paddies of northern Peninsular Malaysia for weather index insurance design. Sustainability (Switzerland), 13(9), 5207. <https://doi.org/10.3390/su13095207>

14. Houma, A. A., Kamal, M. R., Mojid, M. A., Zawawi, M. A. M., & **Rehan, B. M.**, 2021. Predicting climate change impact on water productivity of irrigated rice in Malaysia using FAO-AquaCrop model. Applied Sciences (Switzerland), 11(23), 11253. <https://doi.org/10.3390/app112311253>
15. Abdi, M.J., Raffar, N., Zulkafli, Z., Nurulhuda, K., **Rehan, B.M.**, Muharam, F.M., Khosim, N.A., Tangang, F., 2022. Index-based insurance and hydroclimatic risk management in agriculture: A systematic review of index selection and yield-index modelling methods. International Journal of Disaster Risk Reduction, 67, 102653. <https://doi.org/10.1016/j.ijdrr.2021.102653>
16. Raffar, N., Zulkafli, Z., Yiwen, M., Muharam, F. M., **Rehan, B. M.**, & Nurulhuda, K., 2022. Watershed-scale modelling of the irrigated rice farming system at Muda, Malaysia using the Soil Water Assessment Tool. Hydrological Sciences Journal, 67(3), 462-476. <https://doi.org/10.1080/02626667.2021.2022682>
17. Fatdillah, E.; **Rehan, B.M.**; Rameshwaran, P.; Bell, V.A.; Zulkafli, Z.; Yusuf, B.; Sayers, P., 2022. Spatial Estimates of Flood Damage and Risk Are Influenced by the Underpinning DEM Resolution: A Case Study in Kuala Lumpur, Malaysia, Water, 14, 2208. <https://doi.org/10.3390/w14142208>
18. **Rehan, B. M.**, Hall, J., Sarifuddin, V. & Penning-Rowsell, E., 2023. A comparison of property-level adaptation and community-scale flood defences cost effectiveness in reducing flood risk (2023), Journal of Flood Risk Management, 2023, *Accepted*
19. Rehan, B. M., Mok, Y., 2023. Discrepancies in estimated flood losses on paddy production: Application of damage models on historical flood records of the Northwest States of Peninsular Malaysia. IOP Conference Series Earth and Environmental Science. 1205(1):012020. DOI: 10.1088/1755-1315/1205/1/012020

Conferences/Other publication

1. **Balqis Rehan** and Jim Hall: *Risk-based appraisal of flood mitigation strategies under variable climate*, Tyndall Centre's Third Annual PhD Conference, Cardiff, 3 - 5 April 2013.
2. **Balqis Rehan** and Jim Hall: *Exploring the limits of stationarity in flood frequency analysis and optimal investment decisions*, European Symposium on Flood Frequency Estimation and Implications for Risk Management, Potsdam, Germany, 6 - 7 March 2014
3. **Balqis Rehan** and Jim Hall: *Flood risk management decision analysis with finite historical records and highly variable climate effects*, Proceedings of the Second International Conference on Vulnerability and Risk Analysis and Management (ICVRAM2014), 2867-2879, 13 - 16 July 2014, University of Liverpool, UK. American Society of Civil Engineers (ASCE). <https://doi.org/10.1061/9780784413609.289>
4. **Rehan, B.M.**, Hall, J.W., 2016. *Uncertainty and sensitivity analysis of flood risk management decisions based on stationary and nonstationary model choices*, in: E3S Web of Conferences (7), 20003, 17 - 21 October 2016. <https://doi.org/10.1051/e3sconf/20160720003>
5. **Balqis Rehan** and Badronnisa Yusof: *Robustness of risk-based optimization methodology in flood protection investment*, Malaysia-Korea Seminar on Healthy River Basin, 17 – 18 February 2016, Kuala Lumpur, Malaysia.
6. **Balqis Rehan**: *How robust is a risk-based optimized protection design to future uncertainties?*. Proceedings of the 37th International Association for Hydro-Environment Engineering and Research (IAHR) World Congress, 13-18 August 2017, Kuala Lumpur, Malaysia
7. **Rehan, B. M.**, Yuhaizad, M.F. and Idham, I.L. (2018) *Towards and end-to-end flood risk assessment in Malaysia: Forming a stage-damage relationship to depict vulnerability*. IHP-VIII Technical Documents in Hydrology.
8. **Rehan, B. M.**, Yodin, A.M (2019) *Using Green Infrastructure to Mitigate Flood Impact: A Review in The Context of Malaysia*. The 6th Putrajaya International Built Environment, Technology and Engineering Conference, 15 – 16 April 2019, Bangi Resort Hotel, Malaysia
9. **Balqis M. Rehan**, Ainun M. Yusuf and Iffah L. Idham: *Flood Risk Estimation of Paddy Production Considering Plants' Age and Flood Durations*. Awam International Conference in Civil Engineering 2019 (Aicce'19), 21 – 22 Ogos 2019, Pulau Pinang, Malaysia

10. **M. Rehan, B.**, Sayers, P., M. Alayuddin, A. U., M. Ghamrawi, M. F., D. Miller, J., A. Kabirzad, S., Kaelin, A., C. Penning-Rowsell, E., H. Basri, B., A. Bell, V., Zulkafli, Z., and J. Stewart, E.: Flood vulnerability assessment: A critical comparison between site derived, national and international depth-damage functions and their use in assessing flood risk in Malaysia, EGU General Assembly 2021, online, 19–30 Apr 2021, EGU21-12731, 2021
11. **Rehan, B.M.**, M. Ghamrawi, M.F.: Uncertainty in estimated flood losses from national and global derived depth-damage functions: A case study in Malaysia, Water Security and Climate Change Conference (WSCC), online, 1-4 March 2021
12. Bell, V., **Rehan, B.**, H. Basri, B., Houghton-Carr, H., Miller, J., Reynard, N., Sayers, P., Stewart, E., Toriman, M.E., Yusuf, B., Zulkafli, Z., Carr, S., Chapman, R., Davies, H., Fatdillah, Eva., Horritt, M., Kabirzad, S., Kaelin, A., Tochukwu, O., Ponnambalam, R., and Simpson, M.: Flood Impacts across Scales: towards an integrated multi-scale approach for Malaysia, FLOODrisk 2020 – 4th European Conference on Flood Risk Management, online, 21-25 June 2021
13. Ulwan, A., **Rehan, B.M.**, Assessment of river gauging data to account for uncertainty in flood quantile estimation: Case studies of Peninsular Malaysia, AICCE'22, 15-17 February 2022.

| Awarded Grants and Consultancy Projects | | | | | |
|---|--|---|--|--------------------------------------|-------------|
| No. | Award Type | Title | Award Authority | Level | Year |
| 1. | Fundamental Research Grant (FRGS: RM61,000) – Project leader | Development of a flood loss model and a flood risk assessment framework for paddy | Ministry of Education | National | 2019-2023 |
| 2. | Understanding the Impacts of Hydro-meteorological Hazards in South East Asia Research grant (RM140,000) – Project leader | Flood Impacts across Scales- informing models of flood exposure and vulnerability via an integrated multi-scale approach | Natural Environment Research Council (NERC) UK and Ministry of Education, Malaysia | National | 2019 - 2022 |
| 3. | Inisiatif Putra Muda Grant (IPM: RM60,000) – Project leader | Flood risk assessment for a vulnerable riverine residential area in the north east states of Peninsular Malaysia | Universiti Putra Malaysia | University | 2017-2019 |
| 2. | Fundamental Research Grant (FRGS: RM76,800) – team member | Quantifying threats to food (rice) security in Malaysia under climate change and mitigation using a weather-based risk approach | Ministry of Education | National | 2017-2020 |
| 3. | Travel Grants (400 pounds) | BHS travel grants | British Hydrological Society (BHS), United Kingdom | Members of the BHS society under 35 | 2016 |
| 4. | Travel, Conference and Fieldwork Grants (200 pounds) | Wolfson travel grants | Wolfson College, University of Oxford | Students of Wolfson college | 2014 |
| 5. | Travel Grant (500 pounds) | ECI small grant | Environmental Change Institute (ECI), University of Oxford | Environmental Change Institute (ECI) | 2013 |
| 6. | Consultancy project | Pinang River Catchment Flood Mitigation Project (Project under Department | Department of Irrigation and Drainage, | National | 2019-2020 |

| | | | | | |
|----|---|---|---|---------------|-----------|
| | | of Irrigation and Drainage, Malaysia) | Malaysia | | |
| 7. | Consultancy project | Effectiveness of Mobile Flood Barrier | Department of Irrigation and Drainage, Malaysia | National | 2022-2023 |
| 8. | Research grant | Assessing the economic impact of water security and building resilience program for local adaptive capacity for water-related disasters in Southeast Asia | Economy and Environment Partnership for Southeast Asia (EEPSEA) | International | 2022-2023 |
| 9. | Fundamental Research Grant (FRGS: RM92,600) – team member | Climate-smart DSS (CSDSS): A New Robust Downscaling Approach for Use in Climate Smart Agriculture (CSA) Practices and Climate Change Studies | Ministry of Education | National | 2019-2022 |

| Professional Services | | | | |
|-----------------------|---------------------|--|---------------|-----------------------|
| No. | Type of recognition | Conference/Journal name/Project | Level | Year |
| 1. | Chairperson | 37 th International Association for Hydro-Environment Engineering and Research World Congress, PWTC, KL. <i>(Theme: Water resources management under increasing uncertainty)</i> | International | 14 – 18 August 2018 |
| 2. | Chairperson | 4th International Conference on Water Resources (ICWR), Bayview Hotel, Langkawi. <i>(Theme: Flood management)</i> | International | 27 – 28 November 2018 |
| 3. | Chairperson | Global Civil Engineering Conference (GCEC), Seri Pacific Hotel, KL. <i>(Theme: Water)</i> | International | 25 – 28 July 2017 |
| 4. | Reviewer | IIE Transactions on Healthcare Systems Engineering | International | 2018 |
| 5. | Reviewer | Indian Journal of Science and Technology | International | 2018 |
| 6. | Reviewer | Journal of Advanced Manufacturing Technology | International | 2018 |
| 6. | Reviewer | International Conference on Sustainable Environment and Water Research | International | 2018 |
| 7. | Reviewer | Special Issue-Jurnal Teknologi 2018 | International | 2018 |
| 8. | Expert panel | MBSA Masterplan Expert Panel for Shah Alam Sustainable Urban Drainage Master Plan (SASUD), 2022 | National | 2022 |
| 8. | Reviewer | International Journal of Disaster Risk Reduction | International | 2022 - 2023 |